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January 31, 1953

U.S. GOVERNMENT PRINTING OFFICE

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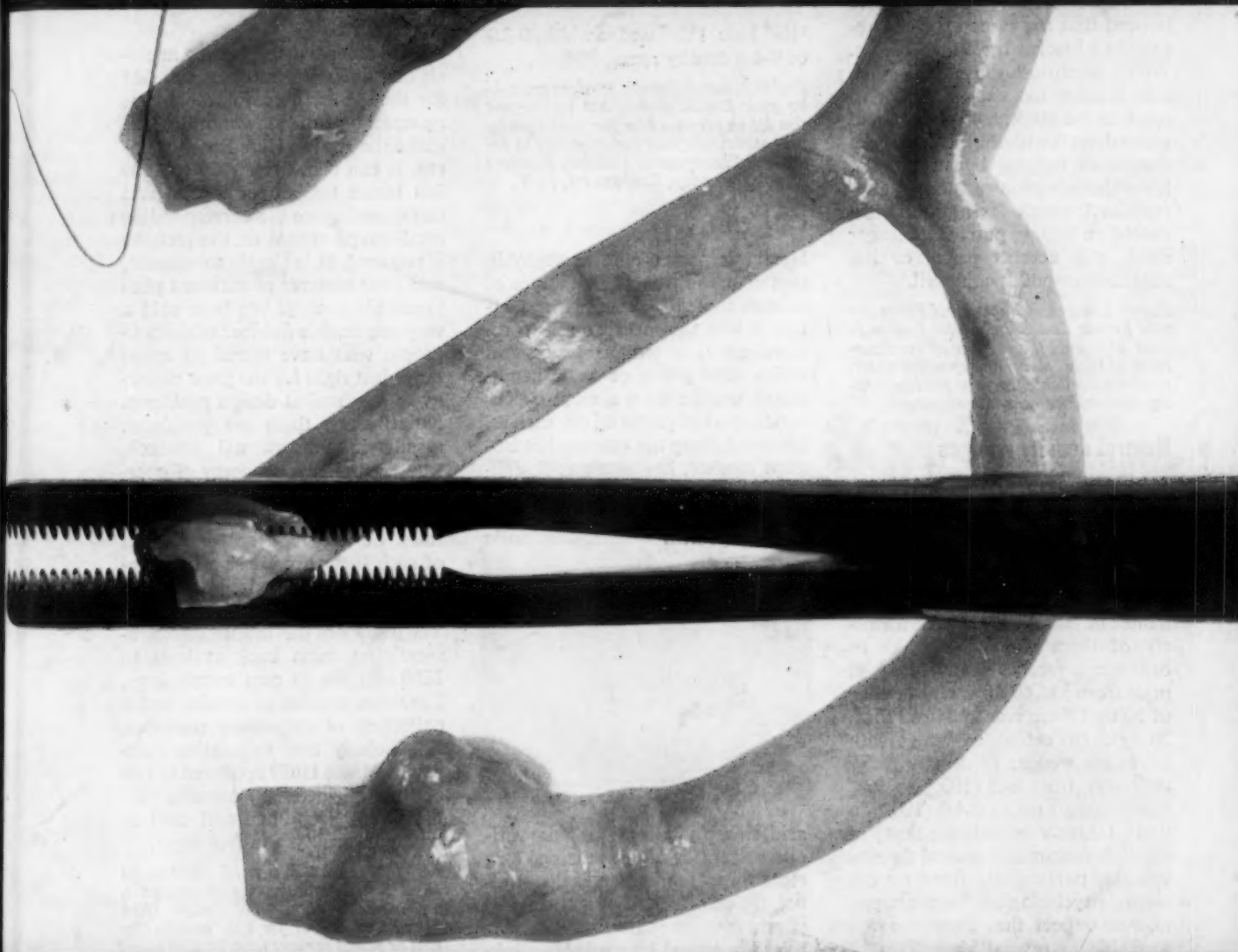
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Saving Clamps

See Page 67

A SCIENCE SERVICE PUBLICATION

Kodak reports to laboratories on:

an improved paper for photorecording . . . circular neutral density wedges . . . taking the hemin out of hemoglobin . . . high speed movies.

Photorecording

"Once you've selected a Kodak Linagraph Paper or Film best suited to your requirements, you can treat every roll of it alike without concern about adjusting exposure and processing practices." We make that statement in our literature and we stand behind it, even though, if you've purchased Kodak Linagraph 809 Paper recently, you may have noticed that the same exposure results in a blacker trace than before. We've improved the emulsion so that it takes less exposure now to produce the blackness you like, and we've done it without increasing the danger of fogging by stray light. It's still an abrasion-resistant, matte-surfaced, quick-fixing emulsion coated on strong, pure white ledger stock, still accepts pencil or ink notations smoothly and well.

Kodak Linagraph Papers and Films are sold by the Kodak Industrial Dealer in your area, and the number of combinations of types, sizes, and spooling specifications available for your photorecording convenience runs into thousands.

Neutral density wedges

Among the many items—photographic, chemical, and optical—which Kodak supplies to small but earnest clienteles are neutral density wedges composed of a carbon dispersion in gelatin on glass. As a matter of fact, there is quite a variety of them which we make as orders are received. They vary in price from \$15.60 for a plain wedge of 10 by 1.5 cm size to \$46.55 for a 20 by 3 cm calibrated wedge with balancing wedge; in density range they vary from 0-3 (100% to 50% transmission) up to 0-4.0 (100% to 0.01%). Lately we've had a flurry of requests for circular neutral density wedges, particularly from experimental psychologists. We are happy now to report that these too are available in several sizes. Two of the more common ones are: 1) $2\frac{1}{2}$ " diameter, $\frac{31}{32}$ " hole, $\frac{11}{16}$ "

wedge width, 0-3.2 density range, \$9.60; 2) $5\frac{3}{8}$ " diameter, $\frac{3}{4}$ " or



$\frac{11}{16}$ " hole, $1\frac{1}{16}$ " wedge width, 0-2.0 or 0-4.0 density range, \$30.

Kodak Neutral Density Wedges are sold by your Kodak dealer, but we suggest you let us prepare him for your visit by first explaining your requirements to Industrial Photographic Division, Eastman Kodak Company, Rochester 4, N. Y.

$C_{34}H_{32}O_4N_4FeCl$

Hemin is part of the hemoglobin that courses through the billions of animals that inhabit the planet. Getting it into the form we sell to researchers is a tedious process in which 3000 grams of crude hemoglobin bought from a meat packer winds up as 20 grams on our shelves. Involved along the way are hot isomyl alcohol, hot acetic acid, delicate adjustment of a pyridine-chloroform system of solvents, coagulation of protein with hydrochloric



acid, slow crystallizations from various solvents without stirring, etc., etc. From all this emerges the product, the chloride salt of an iron porphyrin in which four substituted pyrroles are joined by methylene linkages around a central iron atom. Despite the conservative "97+%"

stated in our catalog and on our label, our control lab reports semi-confidentially that the actual purity usually runs above 99%.

This is but one of over 3500 organic chemicals appearing in Eastman Organic Chemicals List No. 38. If you haven't a copy, write to Eastman Organic Chemicals Department, Distillation Products Industries, Rochester 3, N. Y.



High speed

As a tool for the engineering analysis of mechanical motions too fast for the eye or even for the sports newsreel type of "slow motion," we make the Kodak High Speed Camera. It can take from 1000 to 3200 full 16mm frames per second and can superimpose the corresponding oscillograph record on the pictures if required. It is simple to operate, and gives pictures of excellent photographic quality. We have sold a very respectable number of them to people who have found its speed range just right for the great majority of mechanical design problems. Nevertheless, there are problems, mostly in fundamental research, where simplicity, economy of operation, and even image clarity must be sacrificed for higher repetition rates. Several high speed cameras of such specialized design have appeared in recent years, and we are frank in our admiration of them. The history of this branch of instrumentation dates back at least to 1880 and has its own terminology, literature, regular symposia, and a collection of impressive successes. A scholarly and exhaustive summary of these lately appeared in one of the engineering journals. We have had it reprinted and shall be happy to send you a free copy.

For the reprint ("Special Report on High Speed Photography in Design"), for inquiries about the Kodak High Speed Camera, or for help in selecting film or plates for any form of high speed photography, address Industrial Photographic Sales Division, Eastman Kodak Company, Rochester 4, N. Y.

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . serving laboratories everywhere

Kodak

SURGERY

New Clamps Save Limbs

Legs and arms of Korean wounded are being saved through use of hand-made clamps that stop bleeding of blood vessels, yet do not injure delicate walls of veins or arteries.

See Front Cover

► IN HIS coat pocket when he flew to Korea the Surgeon General of the Army, Maj. Gen. George E. Armstrong, carried seven shining, stainless steel clamps.

These clamps are credited by Army surgeons with doing a tremendous leg and arm saving job among the wounded in Korea. But they are in such short supply that whenever a few come off the assembly line they are rushed to Korea by the next medical officer flying out. Even the Surgeon General is pressed into this kind of messenger service.

The reason the clamps are in short supply is that they are all hand made. The original assembly line, if it could be called that, was in the basement of a German-born instrument maker's home in Glen Ellyn, Ill., a Chicago suburb.

The special feature of these clamps are their 20 very small and perfectly aligned teeth. The teeth are so arranged that when the clamp is closed over a blood vessel, bleeding is stopped but there is no injury to the delicate walls of the artery or vein.

One of these clamps, about four times life size, is shown on the cover of this week's SCIENCE NEWS LETTER.

The teeth of the clamp follow the principle of the bed of nails Indian fakirs lie on without injury. The nails in the bed, and the teeth of the clamps, are so evenly placed that there is no undue pressure at any one point and therefore no injury.

The clamps are called Potts ductus forceps, after Dr. Willis J. Potts of Chicago who had them made for heart operations on "blue babies." They are made by Bruno Richter. The clamps, or forceps, are seven and a half inches long. The teeth are one millimeter deep and one-half millimeter apart. A millimeter is about four hundredths of an inch. The teeth are hand tempered, hand set and hand filed.

Maj. Edward J. Jahnke, MC, vascular surgeon at Walter Reed Army Hospital, Washington, began using the clamps in 1949. Last summer he took two sets to Korea for use in combat surgery there. Surgeons at Mobile Army Surgical Hospitals were so delighted with them that more were ordered and Mr. Richter started working about 18 hours a day, seven days a week, to supply the Army needs. His basement workshop has been moved to a 30-by-60-foot building in Lombard, Ill., and two assistants work with him, though the hand-work is still done by Mr. Richter.

The clamps, or forceps, cost \$35 apiece. They are said to be saving millions in dis-

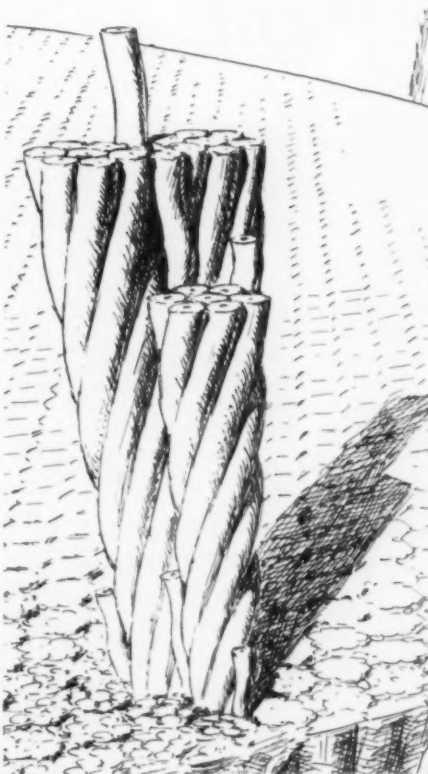
ability payments that would otherwise go to veterans losing legs or arms. They are used to hold blood vessels during operations in which torn veins or arteries are pieced together with grafts or, if still long enough, brought together and their ends reattached by surgical stitches.

Science News Letter, January 31, 1953

CHEMISTRY

Hair Proteins Contain Rope-Twisted Molecules

► HAIR, FINGERNAILS, muscles and other body proteins contain molecules twisted into the shape of ropes and cables, two California Institute of Technology scientists, Drs. Linus Pauling and Robert B. Corey, have reported.



STRUCTURE OF HAIR MOLECULES—An artist's conception of the molecular structure of hair. Three seven-strand cables and several intersitial protein molecules protruding from a cut section of one hair, greatly enlarged, are shown.

In 1951 (see SNL, Sept. 15, 1951, p. 163), the two chemists announced that the individual molecules in many proteins consist of a series of atoms of carbon, hydrogen, nitrogen, oxygen and sometimes other elements coiled into spirals or helices.

Now they have found that seven of these coiled molecules can be twisted into a cable, and they believe that these cables are present in hair and some other proteins. Each cable consists of a central molecule, coiled into a spiral, and six other molecules, also coiled into spirals, which are themselves coiled around the central molecule to form the seven-strand cable.

In rope, individual strands are coiled in one direction, and then the strands themselves are coiled around one another in the opposite direction, thus preventing its unraveling.

Drs. Pauling and Corey believe that some body fibrous proteins are similarly constructed. The individual molecules coil in one direction to form a helix in the shape of a left-hand screw. The set of coils then twists around the central molecule, with the twist in the direction of a right-hand screw.

The chemists' work is sponsored by U. S. Public Health Service, the Office of Naval Research and the Rockefeller Foundation.

Discovering the shape of proteins is important because the vital puzzle of life itself is wrapped up in the structure of proteins and other polypeptides.

Science News Letter, January 31, 1953

MEDICINE

Q Fever Discovered In Egypt Virus Research

► Q FEVER, one of mankind's newer disease plagues, has now turned up in Egypt. The disease was first discovered in Australia in 1937 and has since appeared in the United States.

Its discovery in Egypt for the first time was made by a Rockefeller Foundation researcher attached to the U. S. Naval Medical Research Unit No. 3 in Cairo.

Germs called rickettsia cause the disease and they are believed spread by ticks. Rickettsia come between viruses and the larger bacteria. Discovery of the Q fever ones was made in the course of a systematic investigation of viruses that cause disease in man and domestic animals and which are spread by insects, spiders or other arthropods.

Virus research has been carried on by Rockefeller scientists since 1916 when yellow fever was the prime target for virus disease fighters. This year the Foundation has appropriated \$275,000 to continue studies of viruses around the world. A new virus laboratory has been set up in Poona, India, and plans call for opening another in Port of Spain, Trinidad, to survey virus diseases in the region which includes the Amazon Valley of Brazil, the Guianas, the Orinoco Valley of Venezuela and some of the Caribbean islands.

Science News Letter, January 31, 1953

ICHTHYOLOGY

Shrimp Feast Lures Fish

► **NOTICE TO fishermen:** when those fish you know are there refuse to bite, try a little scientific investigation.

Last fall when the big striped bass were running in Chesapeake Bay, fishermen were baffled when the fish turned up their snouts at the usual fare of plugs and fish bait. Then they got the bright idea of examining the stomach contents of the few striped bass they managed to hook.

This turned up the answer. The fish had found a better chow. The fishermen found the fishes' stomachs full of an odd creature that seemed a mixture of shrimp, porcupine and steel trap.

U. S. Fish and Wildlife scientists identified the animal as the mantis shrimp, *Squilla empusa*, named for his striking resemblance to the praying mantis, an insect. It is a flattened, armored, spine-covered relative of the commercial shrimps, armed with a pair of very effective claws.

Dr. Fenner Chace, crustacean expert of the U. S. National Museum, said that although the mantis shrimp are always pres-

ent in Chesapeake Bay, there is undoubtedly an increased number of them in the bay now. He said it is very likely that striped bass find them tastier to eat and easier to catch than the old stand-bys of small fish.

But allaying the fears of the fishermen, Dr. Chace said the situation was probably only a temporary one, brought on by some non-permanent change in the bay environment favoring increase of mantis shrimp.

Members of the mantis shrimp family are found all over the world, Dr. Chace said, and in some areas are eaten by man. They are often caught in trawls mixed with commercial shrimp, but in comparatively small numbers.

In the meantime, fishing authorities in the Chesapeake Bay area advised sports fishermen to put away their artificial plugs for a while and go after the striped bass with baits of mantis shrimp or frozen commercial shrimp.

A little scientific looking paid off in this fishermen's problem. Can it solve yours?

Science News Letter, January 31, 1953

ENGINEERING

Atomic Power Plants

► **DESIGN OF** super-modern atomic power plants will be challenging to engineers because of "unusual problems" that must be solved to make them safe, M. A. Schultz of the Westinghouse Atomic Power Division told the American Institute of Electrical Engineers meeting in New York.

In atomic powerhouses, nuclear reactors will take the place of giant oil- and coal-burning furnaces now used. Heat given off by atomic fission will be carried to the boilers and converted into steam to drive the generators.

But the nuclear reactors will create radiation hazards which must be solved before the reactors can be used safely. In addition, nuclear reactors will require special instrument schemes to let operators know what is going on inside them. And because they are capable of generating terrifically high temperatures, some way must be found for getting rid of excess heat.

Start-up and shut-down requirements also will pose problems to the design engineers. Reactors cannot be started up too fast and never can be really shut down, he said.

"In considering the output of the nuclear reactor, there is no such thing as 'zero power' involved. Even in a brand new, cold, clean reactor which has been shut down as much as possible, an inherent source of neutrons exists which causes a certain amount of nuclear fission to occur."

When control rods are shoved into the reactor to "cut it off," many secondary radiation, such as gamma rays from fission products, often generate "substantial" amounts

of power. It may be necessary to dump this spare power into a useless load.

Nuclear poisons created when reactors are shut down also must be considered in power plant design. The poisons build up and reduce the overall reactivity of the reactor. The poisons ultimately die away, leaving the reactor unharmed. But they can become strong enough to make the reactor inoperative for a while. In power plants, which must be turned on and off as the demand for electricity changes, some way must be found to get around the effect that atomic poisoning has on the productivity of the reactor.

Science News Letter, January 31, 1953

VETERINARY MEDICINE

Chemical in Poultry Food to Fight Disease

► **WITH THE** hope of helping to prevent air sac disease of poultry, which may kill up to 50% of affected chickens and turkeys, the Food and Drug Administration issued a new regulation permitting addition of para-aminobenzoic acid to poultry feed.

This chemical, sometimes classed with the B vitamins, will not, FDA is satisfied, cause any harm to people eating the chickens and turkeys that get it in their feed. And if the chemical can stop air sac disease, it may mean more chickens and turkeys for people to eat. It may be added directly to feeds or with the antibiotic formula used to promote growth.

Air sac disease is a chronic ailment which has become more prevalent and more important economically within the past two years, although poultrymen have known it for much longer. The reason for this increase is not known. Scientists are not agreed on the cause of the disease, though a germ somewhere between a bacterium and a virus in size is considered at least one cause.

Besides killing birds, this disease is a debilitating one, causing extensive loss of flesh and drop in egg production. In broilers it may prolong the time they must be fed to marketable size from the usual 10 or 11 weeks to 15 or 16 weeks.

Science News Letter, January 31, 1953

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GENERAL SCIENCE

Scientists of the Future

Winners of Twelfth Annual Science Talent Search now announced. Nine girls and 31 boys will come to Washington to compete in the finals for scholarships totaling \$11,000.

► THE 40 most promising young scientists in America's high schools have just been selected in the Twelfth Annual Science Talent Search. The winners—nine girls and 31 boys—have been invited to Washington for a five-day all-expenses-paid visit Feb. 26 through March 2.

They will participate in the Science Talent Institute and compete for \$11,000 in Westinghouse Science Scholarships in the finals of the Science Talent Search conducted by Science Clubs of America, administered by SCIENCE SERVICE.

The 40 tripwinners, 15 to 18 years of age, were chosen by a panel of judges after a nation-wide competition in which top-ranking seniors in all the public, parochial and private schools in the continental United States were invited to participate.

Entrants, representing every state in the Union, totaled 14,260, of whom 2,264 completed the stiff science aptitude examination, submitted recommendations and scholarship records, and wrote a report on "My Scientific Project."

At the end of the winners' five-day stay, Feb. 26 through March 2, the judges will award the scholarships. One boy or girl will receive the \$2,800 Westinghouse Grand Science Scholarship (\$700 per year for four years). The runner-up will receive a \$2,000 Westinghouse Science Scholarship.

Westinghouse Science Scholarships, ranging in size from \$100 to \$400 and bringing the total to \$11,000, will be awarded at the discretion of the judges to the rest of the winners.

The scholarships may be used at any college, university or technical school of the winners' choice so that they may continue their training in science or engineering.

Represent 20 States

Chosen without regard to geographic distribution, the 40 trip-winners come from 32 cities in 20 states. All of the states represented have had at least one winner in previous Searches. States represented by winners since 1942 total 40.

Two high schools in the United States have produced more than one winner this year. Erasmus Hall High School of Brooklyn, N. Y., will send one boy and one girl. Two girls have been invited from Hunter College High School, New York.

Twenty-one of the winners this year come from schools that have never before placed winners in the annual Science Talent Search. The other 19 are adding new laurels to schools already honored by having produced winners in the past. Each school

producing a winner receives a bronze and walnut plaque for its trophy collection.

The honor of having produced another this year to bring their 12-year total to 16 winners goes to Forest Hills (N. Y.) High School. Only two other schools in the U. S. can tie or surpass this record.

Three Brooklyn, N. Y., High Schools have upped their total of winners during the 12 years of the Science Talent Search thus: Abraham Lincoln High School, 8; Brooklyn Technical High School, 7; Midwood High School, 6.

These two schools have produced five winners each in the past 12 years: Evanston, Ill., Township High School, which also has the honor of being the only school to have placed two as winners of Westinghouse Grand Science Scholarships, and The Phillips Exeter Academy, Exeter, N. H.

These three schools have produced four winners each in the past 12 years: North Phoenix High School, Phoenix, Ariz., Erasmus Hall High School, Brooklyn, N. Y., and William Howard Taft High School, New York.

Hunter College High School, New York, has had three winners over the past 12 years and the following schools have had two winners each: Pasadena (Calif.) City College High School; The Hotchkiss School, Lakeville, Conn.; University High School, Bloomington, Ind.; William Chrisman High School, Independence, Mo.; Scarsdale (N. Y.) High School; Tottenville High School, Staten Island, N. Y., and Central High School, Tulsa, Okla.

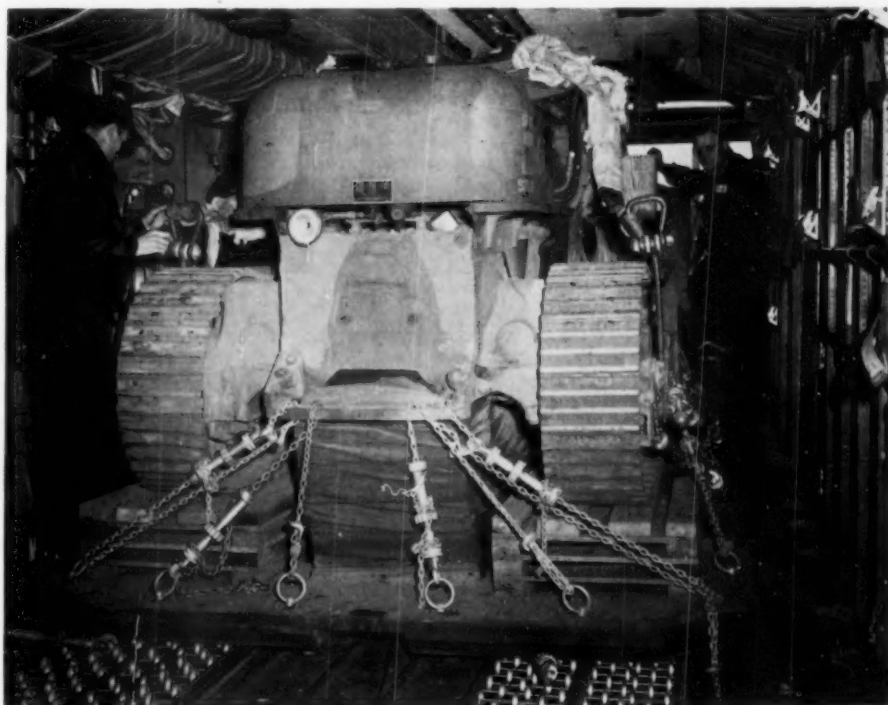
A brother of this year's winner from Tottenville High School was also a winner from the same school in 1948.

Most of the winners live at home and attend their local or nearby public, parochial or private secondary schools. Two attend private schools in other states.

Interests Are Varied

More than 52% of the Science Talent Search trip winners rank first, second or third in their graduating classes, which range in size from 42 to 1,002 students. Exactly 70% of the winners' fathers and 60% of their mothers attended college. A number have parents who were born or educated abroad. Three-fourths of the winners claim no scientists among their relatives, the other 10 have one or more scientists among their close or distant relatives.

Contrary to a frequent conception of scientists, the winners are not interested in science only. While most of them spend much of their spare time in science pursuits such as science clubs and individual hobbies



"OPERATION TEST DROP"—In maneuvers simulating establishment of an "invasion airhead," Army engineers and Air Force troop carrier crews recently dropped 400 tons of construction vehicles in the first mass paradrop of heavy engineering equipment near Fort Bragg, N. C. Shown here is a 21,000-pound crawler tractor just before the drop.

of a scientific nature, all of them have participated in varied extracurricular interests such as music, athletics, journalism and dramatics, and all belong to social and educational organizations.

Many of the top 40 have already chosen the lines of study they wish to pursue. Physics attracts eight, while 11 lean toward careers in engineering, and four intend to study medicine. Others plan careers in geology, mathematics, chemistry, biology, entomology, paleontology, geochemistry, and zoology. All hope to do research in their respective fields.

260 Honorable Mentions

Well over half of the 440 winners in the first 11 Science Talent Searches held since 1942 now have undergraduate degrees. Masters' degrees have been earned by 64 and doctors' degrees (M.D., Ph.D., D.Sc.) have been granted to 40 of the 440. More than 85 are now employed full-time in science jobs in industry, government or professions, or are on university teaching or research staffs. None of the 440 previous winners is more than 30 years old.

In addition to the 40 trip-winners, who will attend the Science Talent Institute in Washington, an Honorable Mentions list of 260 in the Twelfth Annual Science Talent Search will be announced Feb. 5. These high ranking contestants will be recommended to colleges and universities for their aptitude in science.

If they are as fortunate as those previously included in the Honorable Mentions list, they will receive offers of scholarships from many institutions of higher education seeking students with talent in science.

Concurrent State Searches

Through an arrangement with Science Clubs of America, 25 states and the District of Columbia are conducting state Science Talent Searches concurrently with the national competition. Twelve of them have produced winners this year. In these 26 areas all entries in the national Science Talent Search will be turned over to state judging committees.

From their entries they will choose state winners and award scholarships to various colleges and universities within the state. Cooperating states are: Alabama, Arkansas, Connecticut, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia and Wisconsin.

The Annual Science Talent Search is conducted by Science Clubs of America, administered by SCIENCE SERVICE. Scholarships are provided and the Science Talent Search made financially possible by the Westinghouse Educational Foundation, an organization endowed by the Westinghouse Electric Corporation, for the purpose of promoting education and science.

GENERAL SCIENCE

STS Winners Selected

* Indicates girls

H. S. indicates High School

ARIZONA

Phoenix *Spangehl, Karen Mateel 16 North Phoenix H. S.

CALIFORNIA

Los Angeles Brayton, Paul Richard 17 James A. Garfield H. S.
Clark, Dennis Richard 18 University H. S.
Pasadena Willis, John Steele 18 Pasadena City College H. S.

CONNECTICUT

Lakeville French, Thayer Carlton 17 The Hotchkiss School
Home: Sewickley, Pa.

GEORGIA

Atlanta *Wright, Nancy Eleanor 17 Joe E. Brown H. S.
Chamblee Menhinick, Edward Fulton 17 Chamblee H. S.

ILLINOIS

Evanston Tangora, Martin Charles 16 Evanston Township H. S.
Glen Ellyn Reynolds, John Charles 17 Glenbard Township H. S.

INDIANA

Bloomington *Hopf, Barbara Erika Gertrude 16 University H. S.
Valparaiso Swarner, David Reynolds 15 Valparaiso H. S.

MASSACHUSETTS

Weston Phillips, Edward Alan 15 Weston H. S.

MINNESOTA

Rochester Moffet, Alan Theodore 16 Rochester Senior H. S.

MISSOURI

Independence Larson, James Daniel 17 William Chrisman H. S.

NEW HAMPSHIRE

Exeter Mumford, David Bryant 15 The Phillips Exeter Academy
Home: Summerland Key, Fla.

NEW JERSEY

Cranford Isles, David Frederick 17 Cranford H. S.
Highland Park Sosin, David Elliott 17 Highland Park H. S.

NEW YORK

Brooklyn Monsky, Paul Henry 16 Brooklyn Technical H. S.
*Forman, Merle Regina 16 Erasmus Hall H. S.
Gross, Charles Gordon 16 Erasmus Hall H. S.
Rubinstein, Robert Leonard 15 Lafayette H. S.
Resnikoff, Howard Lenard 15 Abraham Lincoln H. S.
Shore, Robert Avery 16 Midwood H. S.
Forest Hills Pearlmuter, Arthur Edward 16 Forest Hills H. S.
Great Neck Strax, Norman 17 Great Neck H. S.
New York *Duchane, Emma Marie 16 Hunter College H. S.
*Itokawa, Etsuyo 17 Hunter College H. S.
*Russ, Joanna Ruth 15 Wm. H. Taft H. S.
Painted Post Cassidy, Harry Joseph 18 Painted Post H. S.
Scarsdale Harte, Kenneth Jeremy 17 Scarsdale H. S.
Tottenville Lubin, Jonathan Darby 16 Tottenville H. S.
White Plains Pirone, Dominick Joseph 16 Archbishop Stepinac H. S.

OHIO

Mansfield *Kirtley, Mary Elizabeth 17 Mansfield Senior H. S.

OKLAHOMA

Tulsa Claytor, Richard Nelson 17 Central H. S.

OREGON

Portland Wolfe, Jack Albert 16 Franklin H. S.

PENNSYLVANIA

Allentown

Schmoyer, Laurence Frederick 17 Allentown H. S.

SOUTH DAKOTA

Vermillion

Winter, John Mack, Jr. 17 Vermillion H. S.

TEXAS

Austin

Barnes, Virgil Everett, Jr. 17 Austin H. S.

VIRGINIA

Norfolk

*Mitchell, Merle Almazetta 15 Booker T. Washington H. S.

WISCONSIN

Oshkosh

Grant, Michael Peter 16 Oshkosh H. S.

Science Clubs of America is the international organization for science groups, in schools and out. Today more than 15,000 clubs are affiliated here and abroad, with a membership of more than one-third of a million young people.

The judges of the Science Talent Search are: Dr. Harlow Shapley, Harvard College Observatory and president of SCIENCE SERVICE; Dr. Harold A. Edgerton, vice president, Richardson, Bellows, Henry & Co., New

York City; Dr. Steuart Henderson Britt, vice-president and director of research, Needham, Louis and Brorby, Inc., Chicago; and Dr. Rex E. Buxton, psychiatrist of Washington, D. C. Drs. Edgerton and Britt design the examination.

Complete details of the national and the 26 State Science Talent Searches are available from Science Clubs of America, 1719 N St., N.W., Washington 6, D. C.

Science News Letter, January 31, 1953

GENERAL SCIENCE

Science Decisions Ahead

► **PRESIDENT EISENHOWER** in the next four years will have to deal with forces of science more powerful than all the billions of dollars at his disposal.

He may be able to turn these powerful forces toward constructing a peaceful and prosperous world. Or he may have to turn them toward constructing the most terrible weapons man has ever seen.

Ex-President Truman set the goal for his successor in his farewell message to the people: "Think what can be done, once our capital, our skills, our science—most of all atomic energy—can be released from the tasks of defense and turned wholly to peaceful purposes all around the world."

"There is no end to what can be done."

Right now the nation, in its universities, in its industrial research laboratories and in its government, has the greatest scientific plant in all history. The new president will have much to say as to how the more than two billion dollars a year the government devotes to scientific research is spent. Now most of it goes into development of new weapons and improvement of older weapons and military equipment.

Facing him is a decision about the H-bomb. Should the Atomic Energy Commission go all out now on stockpiling H-bombs, or should construction of A-bombs continue to have importance? Here the scientific merges with the strategic. The question becomes one of the most efficient use of scarce fissionable material.

The new President will also have to decide how much of the Atomic Energy

Commission's efforts should be directed toward development of the peaceful uses of atomic energy. Should the attempt to build an economical reactor to produce power for industry be speeded? What part should private industry play in the development of atomic power for factories?

These questions will be discussed in Congress, too. Right now Congressional opinion seems to be in favor of allowing private industry to develop atomic power by giving it the right to own fissionable materials. This will necessitate a change in the present law.

Science News Letter, January 31, 1953

PLANT PATHOLOGY

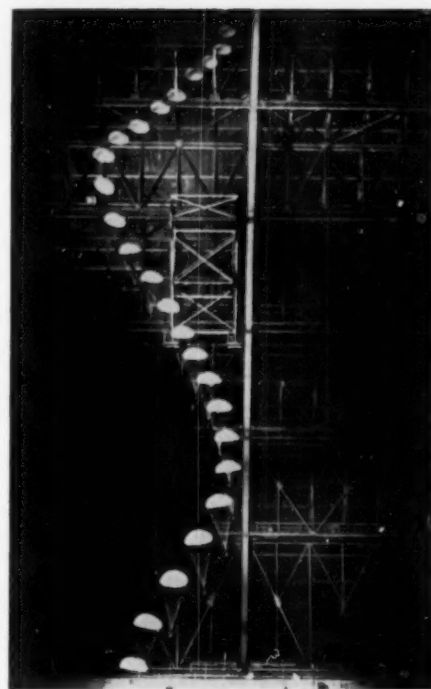
Zanzibar Clove Crop Is Attacked by Fungus

► **THE CLOVE** crop of Zanzibar, which provides nine-tenths the world's supply of this spice, perfume and medicine, is being destroyed by the sudden-death disease.

Two scientists from Britain's Rothamsted Experimental Station, investigating this disaster to Zanzibar's principal crop, have found that it is due to a fungus of an undescribed species of *Valsa*, which attacks the root system and then spreads to the whole tree.

Young trees are comparatively resistant and seedlings are immune, it is revealed in the report sent to *Nature* (Jan. 17) by F. J. Nutman and F. M. Roberts.

Science News Letter, January 31, 1953



PHOTOGRAPHIC PARACHUTE STUDY—The free-fall tendencies of various kinds of parachutes can be studied, using a series of timed stroboscopic exposures, taken at night under powerful spotlights.

AERONAUTICS

Parachutes Get Workout In Big Airplane Dock

► **MAKESHIFT** ELEVATOR shafts have given way to a spacious building at the Goodyear Aircraft Corporation, Akron, Ohio, as a site for testing new parachutes for jet-age aviators.

The building, an airplane dock, is the largest in the world without interior supports. It supplants silos, elevator shafts and outdoor tower installations, and reduces the number of expensive actual flight tests that new-design parachutes must go through.

From its 200-foot high ceiling, the largest military and civilian types of parachutes can be dropped. The building shelters the 'chutes from interfering wind currents and lets scientists study their flight paths, drag, stability, weight-carrying capacity and opening characteristics.

The controlled "atmosphere" permits a series of scientific photographs to be taken as the parachute blossoms into fullness and lowers its weight to the floor. The enclosed building also lets one parachute be compared to another under the same conditions.

The parachutes are being tested under an Air Force contract by a team of engineers from Goodyear Aircraft's research and development department. Tests are being run on such types as the standard flat-circular parachute in common use today, and the ribbon and guide-surface parachutes.

Science News Letter, January 31, 1953

TECHNOLOGY

Ultra Sound Inspects Recapped Auto Tires

► **LONGER-LASTING RECAPPED** tires will result from an ultrasonic method of tire inspection developed at Akron, Ohio.

The specialized equipment allows spotting of internal defects, not visible to the eye, in all sizes of tires. It is frequently economical for car owners to prolong the life of tires by recapping them, if smooth tread and obvious cuts and breaks are the only defects. Many tires, however, have internal flaws that cannot be detected by ordinary inspection, but make them a loss for recapping.

In the method developed by W. E. Morris, R. B. Stambaugh and S. D. Gehman of the Goodyear Tire & Rubber Company's research laboratories in Akron, the tire is rotated through a tank of liquid, which can be either water or alcohol. The ultrasonic vibrations are transmitted through the tire to a microphone lowered inside the tire and covered by the liquid.

The tread region, where the unspotted flaws occur, is scanned from shoulder to shoulder as the tire revolves. The output of the microphone is read on a meter. When the meter readings drop or when a red light replaces the green "OK" light on a panel light, the tire has flaws that mean it must be discarded, or must be repaired before it is recapped.

The ultrasonic inspection detects separations in the tire structure, internal breaks and porosity or looseness around the cords. Inspection records and the actual mileages obtained after recapping gave good correlation, the scientists report in *Review of Scientific Instruments* (Dec., 1952).

Science News Letter, January 31, 1953

HOME ECONOMICS

Good Light Needed for Sewing

► **MANY WOMEN** do their sewing at night, when artificial light is needed. Even those who can find time for the darning, mending and other sewing jobs during the day will need artificial light on these dark winter days.

For comfort and efficiency and to avoid tired feeling eyes, the right light is important.

Home economists of the U.S. Department of Agriculture recommend good general illumination and also a close lamp that directs bright light on the work for sewing. General illumination of the room prevents the eye-tiring contrast between sharp points of bright light and shadowy areas in the room.

In addition, a bright light beamed on the place where the needle is working is needed. This bright direct light should always come below the eye level.

Especially convenient as a sewing light is an adjustable lamp with a swing arm which

allows the light to be moved up or down or sidewise, as needed to bring it close to the work. For hand sewing the specialists suggest clamping a small flood-light in a photographer's swivel to the stem of a 300-watt floor lamp.

Suit the brightness of the direct light to the job, they suggest. Fine stitching on dark fabric calls for the most light.

A portable lamp for sewing is suggested so that it can be used wherever the home-maker chooses to sew. A regional farm-housing study showed that many women would like a separate sewing room. But extension specialists report that at present sewing often is done "all over the house"—in the living room or even the kitchen in winter and in bedrooms in summer. In the South many farm women reported the bedroom as the preferred location for sewing.

Science News Letter, January 31, 1953

TECHNOLOGY

Electric Panels, Glued To Ceilings, Heat Rooms

► **HOMEOWNERS NOW** can heat their houses with rubber panels only 1/16th of an inch thick which can be glued right to the ceiling.

The panels consist of a layer of electricity-conducting rubber mounted between insulation paper. Aluminum foil on both outer surfaces protects the rubber inside from moisture.

Developed by the United States Rubber Co., New York, the panels are relatively inexpensive. They are designed to turn electricity into radiant heat for supplementary warmth in hard-to-heat rooms. They can be used exclusively to heat room-additions to houses. Whole houses can be heated economically in locations where electricity is inexpensive.

The panels are rated at 22 watts a square foot and work on either 115 or 230 volts. The surface heats evenly to about 100 degrees Fahrenheit, the company says, and presents no hazards of abnormally high temperatures in concentrated points.

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PUBLIC HEALTH

Blame Noxious Fumes For Lung Cancer Increase

► **NOXIOUS DUSTS**, gases, fumes and mists in industrial workrooms have now been blamed as perhaps responsible for the increase in recent years in cases of lung cancer.

The idea appeared in a report by Dr. May R. Mayers of New York at the meeting of the Congress on Industrial Health sponsored by the American Medical Association in Chicago.

Inhaling dusts, fumes and gases, she also pointed out, may not necessarily result in damage to the breathing organs but may have harmful effects on other parts of the body.

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IN SCIENCE

ENGINEERING

Electric Utilities Still Need Readers for Meters

► **THE MAN** from the power company who reads your meter will continue to knock regularly on your door in the future. Remote meter reading seems to be impractical at the present.

New and less expensive telemetering methods will have to be devised before remote meter reading will be economical. J. R. Macintyre of the General Electric Company, and W. C. Israel of the Detroit Edison Co., reported to the American Institute of Electrical Engineers meeting in New York. The men saw no promising new methods in the immediate future.

Telemetering is a system of relaying information automatically from one spot to another. It is used, for instance, in sending weather information to the ground from instruments carried in high-flying balloons.

In a joint study conducted by the two companies, engineers also learned that it is not economical at this time to equip meter readers with portable computers so they can make out bills on the spot.

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TECHNOLOGY

Standard Smoothness Saves Machine Cost

► **MACHINE MANUFACTURERS** can slash costs by standardizing the surface finishes of their products.

Reporting to the American Society of Mechanical Engineers meeting in New York, Michael W. Papp, standards engineer of the Warner and Swasey Co., Cleveland, said his company cut painting time more than 50% and at the same time improved the appearance of the product within a year after developing such a scheme.

Machines must be good lookers as well as good workers if they are to be successful on today's competitive market, he said. Color, smoothness and luster of the final product have the greatest effect on buyers.

Although color can be controlled carefully, the smoothness and luster of machines often vary during manufacture. To produce standard finishes, Mr. Papp said his company developed cast-iron samples of the machines with the surfaces finished properly. Machinists use the samples as guides.

Simple drawings of the machines also are supplied to painters and inspectors as references. The drawings show the machine surfaces in different colors. Red, blue and white designate whether the surface is to be super-smooth, satiny or rough.

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SCIENCE FIELDS

ENGINEERING

Grounding Electric Equipment Is Urged

► PROPER GROUNDING of equipment that might come in contact with electric current is one of the best safety measures that industry can take to protect its personnel from electric shock and possible electrocution.

Although presumably safe, ungrounded equipment is hazardous. During 1951 in California alone, 117 injuries, including one death, resulted from electric shock due to ungrounded equipment. L. G. Carpenter of the General Electric Company reported to the American Institute of Electrical Engineers meeting in New York.

Small or portable electrical equipment accounted for 87 of those injuries. The devices operated on low voltages which often are not considered dangerous, but which actually have killed men.

When an object is grounded, it actually is wired to the ground. That can be done by running a wire from the device to metal water pipes buried in the ground, and to special rods driven deep into the earth.

But all such "ground electrodes," he pointed out, should be of a non-corrosive metal, such as copper or copper-bearing steel. Corrosion reduces the effectiveness of the buried metal in draining off electricity that might harm persons touching the equipment.

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TECHNOLOGY

Inhibitor May Solve Acid Pollution From Coal

► NATURE IS mixing air and water with pyrite in the shafts of soft coal mines, creating at least a \$3,000,000 pollution problem, and is dumping it in America's streams and rivers. But a research team at Johns Hopkins University, Baltimore, may have found an answer to the problem.

The answer is an "inhibitor" that stops the production of sulfuric acid when air, water and pyrite-bearing soft coal are mixed in the laboratory. It is hoped the chemical will work as well in coal mines.

The scientists would not describe the chemical make-up of the inhibitor, nor would they speculate as to its practicality until field tests are run in the next few months.

The Johns Hopkins research team consists of Dr. Charles D. Renn, sanitary engineering expert, Dr. Walter A. Patrick, professor of chemistry, and Floyd W. McCollum, a graduate student in chemistry. The men are working under a fellowship

sponsored by the Interstate Commission on the Potomac River Basin, Washington.

The seriousness of the pollution problem is dramatically brought to light by the fact that more sulfuric acid is created in America's coal mines than is manufactured commercially in the entire world. Estimated at 10,000 tons a day, the acid seeps into rivers and kills fish and damages industrial equipment. The damage done by the acid in 1943 was estimated at about \$3,000,000.

New coal mines increase the seriousness of the problem. As they are opened, or as new shafts are sunk in old mines, more sulfuric acid is made by nature. Old coal mines continue producing the acid at a steady rate.

Pyrite, commonly called fool's gold, is a disulfide of iron. A special form of it that occurs in most soft coal fields is called "sulfur balls."

When sulfur balls are exposed to the elements in the presence of a common chemical, the reaction produces sulfuric acid and ferric hydroxide. The ferric hydroxide drops out when it reaches the stream, leaving the acid.

In the United States, the pollution problem is concentrated along the Appalachian mountain chain.

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ENGINEERING

Lightning in Andes Shows Freakish Nature

► FREAKISH LIGHTNING behavior has been found nearly three miles high in Peru's Andes. Lightning bolts there are three times more severe than at normal altitudes, and electrical storms occur when the temperature hovers around freezing.

That is not in accord with lightning behavior in Colorado's mountains. From studies conducted there, engineers noticed that lightning strokes were weaker higher in the mountains than they were at lower altitudes. The engineers decided lightning should be non-existent at 18,000 feet.

Yet 14,650 feet high in the Peruvian Andes, lightning intensity ranged from 7,100 to 119,300 amperes—three times more current than had been found in bolts at normal altitudes.

The freakish nature of Peruvian lightning was revealed in a five-year study conducted by the Cerro de Pasco Corp., La Oroya, Peru.

The observations were made at Cielo Punta Peak, about 150 miles northeast of Lima. The peak is the highest point on a double-circuit transmission line between Cerro de Pasco and Oroya. It lies in the heart of Peru's rich copper, lead, silver, gold and zinc fields.

Details of the study were reported to the American Institute of Electrical Engineers meeting in New York by B. C. Maine and C. Lee, both of the Peru power company, and C. M. Foust of the General Electric Co., Schenectady, N. Y.

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SURGERY

Lobotomy Operation Aids Mental Patients

► THE BRAIN cutting operation known as prefrontal lobotomy can bring "striking" improvement to chronically sick mental patients when their condition is compared to what it was before the operation.

The improvement is generally kept over a five-year period after the operation.

But in most patients the improvement does not bring them to the level of adaptation they made before they got sick.

These are the conclusions of a five-year follow-up study of 100 patients reported by Drs. Milton Greenblatt and Harry C. Solomon and Miss E. Emily Robertson of Harvard Medical School and Boston Psychopathic Hospital in the *Journal of the American Medical Association* (Jan. 17).

Of the 100 patients, 40 were living in the community, 45 were still in hospitals, 12 had died and three could not be traced. Only two of the 12 deaths could be directly attributed to the operation.

Of those on whom information was available, 29% were making a "good" work adjustment five years after the operation. Before the operation only two percent were making a good work adjustment and 66% had a good work adjustment before their mental illness began. By a "good" work adjustment, the doctors mean full time and productive employment, either at home in the case of housewives or in industry earning a regular salary. In some cases a good rating was given to patients who were working steadily and full time in the hospital on some industrial project.

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ENTOMOLOGY

Oriental Scale Attacks Austrian Pines in U. S.

► AN ORIENTAL scale insect that attacks conifer trees has been discovered infecting Austrian pines near Baltimore.

This is the first record of this exotic insect pest in the United States, said Dr. William W. Cantelo, entomologist with the Bartlett Tree Research Laboratories, Stamford, Conn., who reported it.

The insect, *Poliaspis pini*, is common in Japan and China, but it is not especially injurious to the conifers there. Dr. Herbert Morrison of the U. S. Bureau of Entomology said the scale insect had been intercepted several times on shipments coming from the Far East to the U. S., but was not known to have become established here.

Only time will tell what effect the insect invader may have on American trees, Dr. Morrison said.

"Economic entomologists always prepare for the worst when a new insect pest turns up in America, but they are often pleasantly disappointed when nothing dire occurs," Dr. Morrison said.

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ASTRONOMY

Brilliant Planets Visible

Venus and Jupiter form an exceptional display in the southwest on February evenings. Partial eclipse of moon scheduled for the 13th is the second eclipse so far this year.

By JAMES STOKLEY

► ANY YEAR at this time, the brilliant constellations visible in the evening sky, particularly toward the southwest, afford about the finest display the heavens have to offer.

In February, 1953, they are made even more glorious by the addition of the two brightest planets, both exceeding in brilliance any of the surrounding stars.

The positions of these stars and planets on February evenings are shown on the accompanying maps. These give the appearance of the skies at about ten o'clock, your own kind of standard time, on the evening of the first; about nine on the 15th, and eight on the 28th.

Most brilliant of all is the planet Venus, which can be seen low in the west even while dusk is gathering and long before any star comes out. It is in the constellation of Pisces, the fishes. On the astronomer's brightness scale it is now of magnitude minus 4.2.

Soon after dusk Jupiter, in Aries, the ram, can be seen high in the south. Though only about a ninth as bright as Venus, Jupiter is still very prominent.

Sirius Is Brightest Star

The planets, of course, shine by reflected sunlight, while the stars are distant suns, glowing themselves. The brightest star now seen is Sirius, otherwise known as the dog-star, in Canis Major, the great dog, visible in the south.

Above and to the right of this group is magnificent Orion, which can be recognized by the three stars in a row that form the warrior's belt. Above these is first-magnitude Betelgeuse, and below we find Rigel, also of the first magnitude.

Five other stars of similar brightness can also be seen. Almost overhead is Capella, in Auriga, the charioteer. To the southeast of this are Gemini, the twins, with Pollux as the brightest star. Just below is Canis Minor, the lesser dog, with the star called Procyon. To the right of this we pass Orion, and then come to Taurus, the bull, in which Aldebaran shines, marking the bull's eye.

The remaining first-magnitude star is in another part of the sky, toward the east, in Leo, the lion. This is Regulus, part of a subgroup of the constellation known as the sickle. Regulus is at the end of the handle of this implement.

February brings the year's second eclipse when, on the 13th, the moon partly comes

in front of the sun. However, it is not visible from the United States or Canada, though it will be seen as the sun is setting in Alaska. Also, it will be visible from eastern Siberia, China, Japan and Korea.

The greatest eclipse will occur at a point near the town of Strelka, in the Siberian province of Krasnoyarsk. Here, just as the sun is rising, about three-fourths of the sun's diameter will be covered by the dark disk of the moon. People in Nome, Alaska, will see about a quarter of the solar diameter hidden shortly before sunset.

Eclipses of Algol

Another type of eclipse can be seen much more frequently. This is of the star called Algol in the constellation of Perseus, seen high in the northwest.

Ordinarily of the second magnitude, in a period of a little less than three days it fades to less than a third of its former brightness, taking about five hours to dim and five more before restoration to its normal magnitude. The times of some of these minima of Algol are given in the "Celestial Time Table" at the end of this article.

Although an Italian astronomer named Montanari is credited with the discovery of the variability of this star in November, 1670, even earlier its peculiar character may have been noted.

The name Algol is a corruption of the older name given it by the Arabs, "Al Ghul," which means "the demon," and it is surmised that they had recognized its variability. Indeed it seems to have had an unsavory character among others as well, for the Hebrews are said to have named it "Satan's head," while the Chinese knew it as "piled-up corpses."

Modern astronomical observations of it have been made, some with the aid of the spectroscope, which not only tells us what a star is made of but also whether it moves toward or away from us, and how fast.

These observations have revealed that this star is not a single orb, like the sun, but consists of two separate bodies, revolving around the center of gravity of the pair, somewhere between them. This is not an unusual condition, for a large proportion of all the stars in the sky are such binaries.

In the case of Algol, however, it happens that one of the stars is very much brighter than the other; also that the solar system is nearly in the plane in which they revolve. The result is that once in every revolution the dark one comes in front of the bright one, producing a partial eclipse, with the decrease in brightness that is observed every few days.

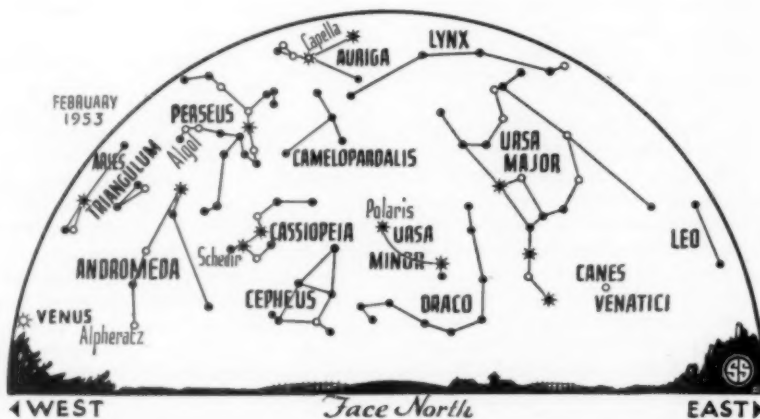
Moreover, an accurate measurement of its light shows that half way between this major diminution in brilliance there is another but not nearly as great. This happens when the bright one hides the faint one, and shows that the latter is not completely dark.

System Has Four Stars

Astronomers have studied Algol, and have learned many facts about this strange system, which is made complex by the fact that, in addition to the two main stars, there are also a third and a fourth. The innermost of these faint companions goes around the pair in a year and three-quarters, and the outermost in 188 years.

They have learned the dimensions of the two stars that undergo eclipse, and that they are separated by about 6,500,000 miles. The bright star has a surface temperature of some 22,000 degrees Fahrenheit, about twice as hot as the sun, and a diameter of about 2,700,000 miles, about three times the sun's.

The fainter star is much cooler than the sun, with a temperature at its surface of





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• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE BIOLOGY OF PARAMECIUM—Ralph Wichterman—*Blakiston*, 527 p., illus., \$9.00. A reference work for students and teachers giving the results of the author's 20 years of research on paramecium.

BIRDS OF WASHINGTON PARK, ALBANY, NEW YORK—Dayton Stoner and Lillian C. Stoner—*New York State Museum, Bulletin Number 344*, 268 p., illus., paper, \$1.60. Lists 122 species and subspecies observed by the authors in this park near the downtown area of the city.

FOUNDATIONS OF BIOLOGY: A Laboratory Handbook—Gairdner B. Momet and Helen V. Crouse—*Appleton*, 282 p., illus., paper, \$2.50. Intended to aid both the non-professional and the pre-professional students to gain competence in laboratory work so that every laboratory period will be memorable.

HEARING AIDS: Their Use, Care and Repair—Matthew Mandl—*Macmillan*, 158 p., illus., \$3.50. The user of a hearing aid, in order to make his life comfortable, must know how to select and wear his aid, how to adjust and maintain it. This book is for him and also for the serviceman.

LIVE LOADS ON FLOORS IN BUILDINGS—John W. Dunham, Guttorm N. Brekke and George N. Thompson—*Govt. Printing Office, Building Materials and Structures Report 133*, 27 p., illus., paper, 20 cents. Information on the amount of load carried by the floors in office buildings, stores, factories and warehouses.

MY BROTHER BILL: The Life of General "Billy" Mitchell—Ruth Mitchell—*Harcourt, Brace*, 344 p., \$4.00. A younger sister tells this intimate story of the life of the great protagonist of military aviation.

NEOMYCIN: Nature, Formation, Isolation, and Practical Application—Selman A. Waksman with the collaboration of Hubert A. Lechevalier and others—*Rutgers University Press*, 219 p., illus., \$4.00. Neomycin was isolated at the Department of Microbiology, Rutgers, in 1949 from a culture of *Streptomyces fradiae*, and was found to have marked activity against various bacteria.

NEXT MILLION YEARS—Charles Galton Darwin—*Doubleday*, 210 p., \$2.75. The grandson of the renowned author of the "Origin of Species" looks into the future and finds it gloomy. Man he portrays as a wild animal—wild and untamable and inherently incapable of producing a master breed.

OCCUPATIONAL DISEASES ASSOCIATED WITH THE IMPORTATION OF RAW MATERIALS—Daniel C. Braun and John F. Ostertter—*Mellon Institute*, 5 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Discussing infections and infestations as well as articles producing allergic reactions.

PAVEMENT-MARKING MATERIALS—William H. Goetz, Chairman—*National Academy of Sciences-National Research Council, Highway Research Board Bulletin 57*, 128 p., illus., paper, \$1.80. Reporting research and tests of materials used for this purpose.

POSSUMS—Carl G. Hartman—*University of Texas Press*, 174 p., illus., \$6.00. Here beautiful photographs show just what the tiny immature opossum looks like at birth and when in the pouch. You can also see this odd animal hanging by its tail and can read the interesting folklore about it.

SMITHSONIAN INSTITUTION: Report of the Secretary and the Financial Report of the Executive Committee of the Board of Regents 1952—Alexander Wetmore, Secretary—*Smithsonian Institution*, 175 p., illus., paper, free upon request direct to publisher, Washington 25, D. C.

WHAT TO LISTEN FOR IN MUSIC—Aaron Copland—*New American Library*, 159 p., paper, 35 cents. A noted composer gives you the technical information you need in order to listen intelligently to good music.

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PUBLIC HEALTH

Atomic Age Dangers

► THE ATOMIC age is bringing increasing danger to industrial workers even if another atom bomb is never dropped. The danger comes from the use of radioactive substances in more and more industrial processes.

We need not, however, have another tragedy or series of them such as the one a generation ago when girls who painted watch dials died of radium poisoning. Exposure to radiation can be controlled and injury to health prevented, Saul J. Harris, physicist with the New York State Department of Labor, declared at the Congress on Industrial Health sponsored by the American Medical Association in Chicago. "The examination of welds and metal castings for flaws by the use of radium and X-ray has become routine in foundry operations in New York State. Radioactive cobalt is being used increasingly for this purpose. The use of betatrons for inspection purposes is also steadily gaining favor in industry," Mr. Harris said.

"The fluoroscope has not only made its way into retail shoe stores, but it is being used in industry as an inspection device—for the detection of misplaced nails in shoe manufacture, for example, or the detection of foreign bodies in packaged foods.

"Radioactive static eliminators are finding an increasing market in plants having potential fire hazards due to accumulations of static.

"Radioactive isotopes are stepping out of the expert hands of technical personnel in research laboratories and are now coming to be used by lay workers who are not familiar with the potential hazards to health or with the precautions which must be taken."

BIOLOGY

Normal Liver Proteins Differ From Cancerous

► THE LIVER of a normal, adult rat contains proteins which show distinct and consistent differences from proteins from a liver of a cancerous rat.

Thus report Dr. A. M. Schechtman and Howard Hoffman of the zoology department at the University of California at Los Angeles, who have recently completed a study of the livers of rats by electrophoresis.

Electrophoresis is a method of identifying molecules by measuring their speed as they are drawn by an electric current. The speed varies with different types of molecules.

Protein molecules from normal, young rats showed a resemblance to those of cancerous livers. This suggests that certain similar changes occur in the proteins of rapidly growing tissue, whether cancerous or not, Dr. Schechtman said.

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The effects of repeated exposure to radiation are cumulative, Mr. Harris warned. Individuals differ in their susceptibility. There may be a long latent period between exposure and signs of injury to health.

Exposure to radiation is particularly insidious because we do not have any senses, such as touch or smell, for perceiving radiation and so can be subjected to dangerous amounts without knowing it.

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ELECTRONICS

Research Produces Better Antenna

► MANY A short-wave radio enthusiast soon may fling his dits and dahs to remote points of the world from a sleeve-type antenna that has been improved through a joint Army-Navy-Air Force radio research project at Harvard University.

The antenna is said to be "more desirable" than the widely used, conventional dipole antenna because of its simplicity and ruggedness. It has a greater band width and can be matched with the transmitting equipment more easily than the usual dipole antenna.

Sleeve-type antennas are coaxial cables in which the inside rods extend beyond the outside cylinder. Until now they have not been widely used because the theoretical analysis which enables engineers to design such antennas for particular setups had not been highly developed.

But the research project resulted in ways to design the antennas by extending the same general principles that work in dipole antenna design.

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• RADIO

Saturday, Feb. 7, 1953, 3:15-3:30 p.m., EST
"Adventures in Science" with Watson Davis,
director of Science Service, over the CBS Radio
Network. Check your local CBS station.

Dean Rusk, president of the Rockefeller Founda-
tion and General Education Board, New York,
discusses "Stimulation of Research."

ENGINEERING

Ocean Cable Fulfills Engineers' Dreams

► A NEW, tough, lightweight ocean cable that can be lowered to the trackless depths of the sea seems to fulfill one of the marine engineer's fondest dreams. It is easier to handle and less expensive to lay than the present steel-jacketed cable now used to link continents.

The cable uses a 10-strand cadmium bronze wire insulated with polyethylene, a relatively new insulating material. C. S. Lawton of Western Union Co. and L. H. Hutchins, Jr., of the Simplex Wire and Cable Co., Cambridge, Mass., reported to the American Institute of Electrical Engineers meeting in New York.

Stress and strain problems that ordinarily require ocean cables to be heavily sheathed in steel jackets have been resolved through new splicing techniques and new methods of paying out the cable. This reduces one of the biggest operating costs that cable companies encounter. Once a cable comes to rest on the ocean floor, it is subjected to little wear and tear because it lies in soft ocean silt. Thus heavy armor is useful only when the cable is being lowered or raised.

About 20 miles of the new cable already have been spliced into a New York-Nova Scotia cable off the coast of Long Island in an experimental test, the men reported.

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BIOCHEMISTRY

Antibiotics Affect Activity of Gland

► A THIRD effect of antibiotics, the so-called mold remedies, has been discovered by Prof. W. R. Breneman of Indiana University.

This effect is a stimulation of the endocrine glands of the body. These glands include the pituitary gland in the head, the thyroid in the neck, the sex glands and the adrenals, source of cortisone.

Working with White Leghorn chickens, Prof. Breneman finds that the antibiotics not only quicken growth of the glands but also cause a marked increase in their secretion of hormones.

Antibiotics, from penicillin to terramycin, first were known for their ability to stop disease germs. Next scientists found that they could hasten growth of animals. The gland-stimulating effect adds a further activity.

Science News Letter, January 31, 1953

TECHNOLOGY

Process Arctic Snow?



SNOWFLAKE CAMERA — Snow particles, enlarged three times, photographed like this with the Army's new camera.

BIOLOGY

Sterile Plants Give Key to New Hybrids

► STERILE MALE plants that cannot possibly reproduce themselves are one of the chief instruments for producing new and better varieties of sugar beets.

In the search for beets with a higher sugar yield and a uniform shape and size for mechanical cultivation, the U. S. Department of Agriculture has been hard at work trying to develop new hybrid strains. But the hunt for new hybrids was tremendously complicated because there was no easy way to separate males and females of the same variety, to avoid interbreeding.

The development of sugar beet strains in which all the male offspring were sterile may have solved the problem.

As the offspring of these strains cannot interbreed, the fertile female plants can easily and safely be cross-bred with pollen from other varieties of sugar beets. This results in pure hybrid varieties.

This technique, which follows the same principle used in making new corn hybrids by removing the pollen-producing tassels, promises to open the way to great advances in the sugar beet industry, the Agriculture Department said.

Science News Letter, January 31, 1953

► THE ARMY has hinted that its scientists are considering the possibility of "processing" snowflakes to make them stick together better.

The hint came in the announcement of a new camera which has been devised to photograph snow crystals. Scientists hope the pictures will help them learn more about snow and how to pack it so that airstrips, buildings and roads can be constructed better in the Arctic.

Although much of the story is cloaked in security, it already is known that military scientists are searching for more facts and figures on the far north. The Arctic is becoming increasingly important as a possible battlefield in a future war. It also is becoming more important as a possible route for globe-girdling commercial airlines. In the absence of usable land, runways, barracks and roads will have to be built on hard-packed snow.

Experimental construction in the Arctic has been going on for several years. Much of what has been learned still remains secret. But it is known, for instance, that buildings sometimes sink annoyingly as heat seeps through the floors and melts the snow foundations below them.

Devised at the Engineering Research and Development Laboratories, Fort Belvoir, Va., the new camera may help to reveal some of the snowflake's innermost secrets. It may provide scientists with a new tool for making the Arctic serve man.

The camera operates in the field from a six-volt jeep or truck battery. It photographs snowflakes in a special chamber before they melt in the heat of its internal light source. It also can magnify the crystals up to 11 times, although it is pre-set to enlarge them only three times.

Science News Letter, January 31, 1953

ENGINEERING

Microbes Eat Insulation Of Underground Cables

► HUNGRY MICROBES, apparently looking for food, will munch on the insulation of underground electric cables covered with natural rubber or GR-S insulation, unless the cable jacket has been treated with a fungicide.

The tiny fungus-like organisms destroy the electrical insulation slowly and can cause eventual cable failures. Two typical organisms found in tests by the Simplex Wire and Cable Company were identified as *Spicaria violacea* and as a species of *Fusarium*.

Results of the tests were reported to the American Institute of Electrical Engineers meeting in New York by Simplex engineers John T. Blake, Donald W. Kitchin and Orison S. Pratt, all of Cambridge, Mass.

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ICHTHYOLOGY

**Mystery Eel Discovered
By Fossil Fish Finder**

► THE SCIENTIST responsible for the discovery of a coelacanth, a fish thought extinct for 50,000,000 years, has turned up a new "mystery fish" from an island off Africa's east coast, near where the coelacanth was captured. (See SNL, Jan. 17, p. 38.)

Prof. J. L. B. Smith of Rhodes University in Grahamstown, South Africa, has found a single, lonesome eel in an isolated body of water on the "eel-less" island of Zanzibar.

Because of the highly porous nature of the island, there are few bodies of fresh water on Zanzibar, Prof. Smith said, and the only river on the island disappears before it reaches the sea. Only three or four fresh-water fish, and no eels, had been reported from Zanzibar, Prof. Smith said.

Then, during a recent visit to the island, Prof. Smith heard of a large "water snake" that had been seen in an abandoned reservoir. He followed a hunch, the same kind of hunch that led to the discovery of the coelacanth, and had the reservoir drained.

There in the mud wriggled a 30-inch well-nourished eel, *Muraena mossambica*.

"This spring lies less than half a mile from the sea," Prof. Smith said, "but how the fish got into it is a mystery, as no water has ever flowed out of it, and the manholes in the roof of the enclosing structure have iron covers, supposed to have been kept closed for many years."

Previous records of eels from "Zanzibar" referred to specimens from African mainland near Zanzibar, not the island itself, Prof. Smith said. This discovery was reported in *Nature* (Jan. 17).

Science News Letter, January 31, 1953

Do You Know?

Almost every American family now has a car.

Olive trees must get some winter chilling to be commercially fruitful.

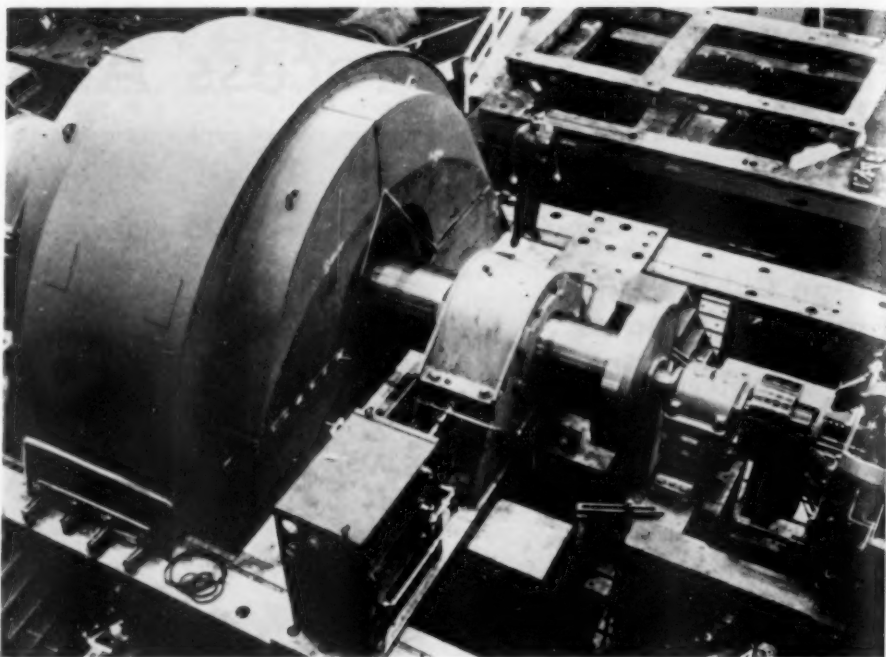
The picture on a TV screen is composed of about 210,000 tiny dots.

Potatoes are one of the few commodities grown commercially in every state.

The world's yearly output of cement is sufficient to pave a road 150 feet wide and eight inches thick around the equator.

Sirius, the brightest star in the sky, is over 4,000,000,000 times brighter than the faintest star photographed with the 200-inch Hale telescope atop Mt. Palomar.

When grapes were displayed both in bulk and in cellophane bags, sales were 17% higher than when either of those displays were used alone, a research study shows.



POWERFUL MOTOR—Shown here is what is claimed to be the world's most powerful motor, one of two rated at 83,000 horsepower each. Combined in tandem fashion with its "twin" and two 25,000 horsepower motors, it will make up a four-motor drive for Air Force wind tunnels at the Arnold Engineering Development Center in Tullahoma, Tenn.

AERONAUTICS

Air Power Long-Range

► LONG-RANGE TRIPS by scheduled jet-propelled airliners between England and South Africa and Ceylon are being flown with success, but aviation experts are not yet wholly convinced that jet propulsion is the best type of power for international air transports.

It is the speediest form, it is acknowledged, but it is not the most economical. The large amount of fuel the jetliners consume makes long-range non-stop flights impractical.

Other types of power plants now available provide speed considerably greater than conventional reciprocating engines. They are said to be economical and they may be able to meet the speed expectations and demands of the flying public.

Two such power plants are the turbo-prop and the new turbo-compound engines. Both have been thoroughly tested and both are now in use in commercial planes.

Air France, operator of an airplane network covering much of the globe, will soon be operating transports powered by jets, turbo-props and turbo-compounds, and later will be able to evaluate the efficiencies and deficiencies of each. It is planning to operate the new American Lockheed Super Constellation between Europe and America, British Viscounts on its European network, and British Comets mostly on services in Africa and the Middle East.

These new Super Constellations are powered with turbo-compound engines, a product of the Curtiss-Wright Corporation. This type of power plant consists of a very powerful piston engine with added turbine mechanisms that operate on the exhaust gases from the conventional engine. Low operating cost is one of its features. The Constellations with this power will have a maximum speed approaching 400 miles an hour.

The Viscounts are turbo-prop planes. This type of engine is a gas turbine that operates conventional propellers. Such planes are claimed to be economical because the gas turbine is a high efficiency engine for the amount of fuel it consumes.

Comets are powered by turbo-jets, the engines used in speedy fighter planes and in several bombers. The first jet-propelled Comet entered commercial transport service in May, 1952, on a route from London to South Africa with several stops en route for refueling.

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Weight for weight, the hovering hummingbird consumes almost as much energy as a modern helicopter.

Persons can see subtle differences in colors better if they are standing than if they are lying down.

GENERAL SCIENCE

U. S. Science Department?

With two or three billion a year now being spent on scientific research by the government, raising of the National Science Foundation to department status is again advocated.

► A SECRETARY of Science? A new department and cabinet position either to coordinate and control the research and development activities of the nation?

Two to three billion dollars a year is now being spent by the government on research and development, most of it by the Department of Defense. There is some duplication in these expenditures: the Army, Navy and Air Force all have their rocket programs.

It is supposed to be the function of the National Science Foundation to survey governmental science as well as private scientific endeavors. The Foundation is expected to advise the President and Congress as to whether the nation has a balanced scientific program. Without such an overall check, we might be neglecting scientific fields vital to our defense or to our health, while we overemphasize fields which have caught the popular or Congressional imagination.

However, the Science Foundation still has little prestige, especially on Capitol Hill. Its appropriation was, under the Democrats, regularly cut far below that thought necessary to do its job. This year, former President Truman's budget calls for \$15,000,000 for the Foundation—perhaps with the economies which might result from such a check in mind, the Republicans will give the Foundation most of this money.

If either the Foundation were raised to the status of a department, or an entirely new department were set up and if it were given some control over allocation of the billions now being spent for defense, the thinking is, we might get more and better research and development for our money. The American Chemical Society in *Chemical and Engineering News* (Jan. 19) advocated making the Foundation a department.

Stumbling block to such a new department might be the concern of the Defense Department over losing control of its research and development program. Defense has set up a Research and Development Board charged with the task of coordinating the scientific efforts of Army, Navy and Air Force.

It would be unlikely that a new Science Department would get more than some say over how Defense dollars for fundamental research are spent. Any attempt at an outside say over the applied research and weapons development program would meet with vigorous opposition from Defense officials.

One assistant secretary in the new department might be in charge of scientific manpower. Defense has a military manpower assistant secretary. Scientists might look with approval on such an official, provided

he has some say as to the drafting and deferment of our short supply of skilled and talented scientists and engineers. Scientific bodies already have launched plans for national control of allocation of this manpower.

Who would be the new secretary? One man suggested is Dr. Alan Waterman, now head of the National Science Foundation.

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MEDICINE

Report Factors in Artery Hardening

► SIX CONDITIONS that seem to be factors in hardening of the arteries, or arteriosclerosis, are listed in a report from the Illinois State Medical Society.

The exact cause of the condition is not known, the medical society report states. But factors in the condition are: 1. heredity; 2. overweight since the condition is found twice as often in obese people; 3. infections; 4. chronic overwork; 5. long periods of inadequate rest; 6. continued nervous and emotional tension.

Normally, the report states, the arteries or canals by which the blood travels to the various parts of the body are flexible and supple. As we grow older, the flexibility and elasticity are lost, resulting in a condition known as arteriosclerosis. This term comes from two Greek words meaning artery and harden. While the disease is associated with the aging process, it also develops in the younger age group.

The only function of the arteries is to convey blood to the cells which make up the various organs, muscles and bones of the body. So long as the amount of blood received or the rate at which the blood is received by a given organ is adequate for its nutrition, nothing happens. But if the arteries become obstructed or so narrow that the flow of blood is interfered with, the groups of cells within the organ die, impairing its function. Again the blood supply may be sufficient for the organ at rest, but insufficient when it is working.

In arteriosclerosis the hardening may be only an increase in the thickness of the wall of the artery with some loss of elasticity and narrowing. Again there may be patchy or plaque-like deposits of fat in and just beneath the lining membrane of the artery. Gradually, calcium salts, which are normally present in the body, are deposited in these fatty patches, where they remain to become stony hard.

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Questions

ASTRONOMY—What can astronomers learn from a study of eclipsing stars? p. 75.

...

BIOCHEMISTRY—What are three effects of antibiotics? p. 77.

...

BIOLOGY—How do sterile male sugar beet plants aid development of new hybrids? p. 77.

...

GENERAL SCIENCE—What scientific decisions face President Eisenhower in the next four years? p. 71.

...

ICHTHYOLOGY—How can scientific investigation aid in catching fish? p. 68.

...

SURGERY—How can the pain of some cancer patients now be relieved? p. 75.

...

VETERINARY MEDICINE—What chemical may now be added to poultry feed to aid in fight against air sac disease? p. 68.

...

Photographs: Cover, Walter Reed Army Medical Center; p. 67, California Institute of Technology; p. 69, Fairchild Aircraft; p. 71, Goodyear Aircraft Corporation; p. 77, U. S. Army; p. 78, Westinghouse Electric Corporation; p. 80, Thatcher Glass Manufacturing Company, Inc.

ENGINEERING

Railroads Expand Use Of "Electric Brakes"

► MORE AND more diesel-powered freight trains now generate electric current and "burn" it in electrical resistors built into the locomotives when the engineer puts on the brakes.

This method of braking is spreading rapidly through railroads using diesel-electric locomotives, A. V. Johansson and H. R. Stiger of the General Electric Company reported to the American Institute of Electrical Engineers meeting in New York.

Called dynamic braking, it resembles another system already used on some railroads. This system is a "regenerative" system. The chief difference between dynamic and regenerative braking lies in the method used to dissipate the power produced. In dynamic braking, the power is burned in a resistor built into the locomotive. In regenerative braking, the railroad's power system takes the energy from the train and employs it elsewhere, or dissipates it in resistors at the substation.

Originally devised for trains that thread their ways through mountainous country, dynamic braking offers many advantages which make it attractive for use on flatlands. As contrasted to mechanical braking methods, it reduces the number of wheel and brake-beam failures due to excessive heat. And when properly used, electrical braking also gives the engineer better control over his train.

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• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C., and ask for Gadget Bulletin 659. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

✿ **MAKE-UP KIT** for theater-minded children, or adults, includes false mustaches, pipes, glasses, tooth black, theater tickets, real grease paint, powder, rouge and a "good-sized" mirror. Three original plays, simplified for amateur production, also are included.

Science News Letter, January 31, 1953

✿ **INSPECTION LIGHT** for use around machine shops features a tiny electric light bulb mounted on two adjustable arms which allow the bulb to reach locations 24 inches from the unit's base. The portable device can be regulated to concentrate a small beam of light exactly where needed and to hold it there, allowing the worker to have both hands free.

Science News Letter, January 31, 1953

✿ **IMAGE BRIGHTENER** attachment for standard fluoroscopic equipment shows doctors fluoroscopic pictures of live, human internal organs 200 times brighter than do screens not equipped with the device.

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✿ **INDIVIDUAL COFFEE** servers each hold two cups of coffee, keeping the beverage hot in small heat-resistant glass containers trimmed with bright-colored plastic insulating neck bands. Having glass stoppers, the servers fit into coffee cups, as



shown in the photograph, so that heat escaping from the servers warms the drinking cups until the servers are removed.

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✿ **"PLASTIC STARCH"** is used like conventional laundry stiffening agents, but it makes treated clothes harder to soil and easier to wash back into brilliance. Containing a special anti-dirt compound, the "plas-

tic starch" coats each fiber in the material with a smooth film which prevents dirt from coming into close contact with the fabric.

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✿ **NEW INSULATION**, not yet available commercially, creates an effective "thermal barrier" where insulation space is limited and heat is a problem. It is said to be 10 times more efficient than any insulation now in use.

Science News Letter, January 31, 1953

✿ **NEW HEARING AID** has a regular microphone and an accessory external microphone which is worn on men's ties or women's dresses to reduce "clothing noise." The aid also has a built-in device which is said to enable the wearer to carry on telephone conversations free from other sounds and interference.

Science News Letter, January 31, 1953

✿ **ELECTRIC CHAIN** saw features 12 log-gripping teeth which hold the saw against the work and enable the machine to spike and feed itself completely. Weighing only 18 pounds, the portable saw operates on standard 115-volt power. It is especially suitable for topping, notching and felling trees.

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• Nature Ramblings •

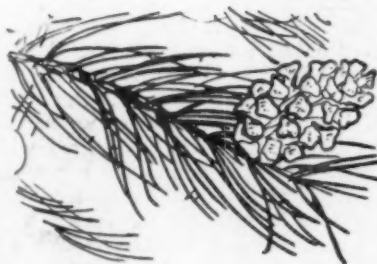
► **FORESTERS, LUMBERMEN**, botanists, even poets, celebrate the "lordly pine"—meaning, usually, a tree imposing to the eye, with a trunk big enough to make a fine log and saw up into handsome boards, or even to serve whole as a mast "for some high ammirail."

There are pines enough to fit such specifications: par excellence the white pines, but also such tall brothers of the yellow-pine series as the long-leaf pine of the South and the ponderosa, black and big-cone pines of the West. Magnificent trees, all of them.

However, there are many pines of lesser stature than these, trees that would stand no more than waist-high or even knee-high to the pines that get all the press notices. They also have their place in the world, even if (like most of us common folks) they never get their names in the papers.

These lesser pines are to be found in all the major tree-growing regions, in all latitudes and altitudes, even in the tropics.

"The Lesser Pines"



But always they grow on the marginal lands, where pickings are meager and where it takes a decidedly thrifty, patient and tenacious plant to succeed at all.

They are found in such places as the sandy coastal plains and clay hills of the South, the ill-balanced soils of the Middle Atlantic coast's serpentine barrens, the rocky shores of New England, the dune sands of

the Lake States and central Nebraska, the thin soils of Southwestern deserts and Rocky Mountain plateaus, the adobe hills and crumbling granites of the Pacific slopes.

In all these places you will find the lesser pines. Often they are spaced far apart because there isn't enough moisture to permit them to grow close together. There they will develop full-branched tops. Seldom, though, are these symmetrically pyramidal like those of their more seemly kin trees. More likely they will be buffeted into gnome-like shapes by the fierce winds of mountainside winters or the soft insistent tyranny of salt-laden sea breezes.

Elsewhere, however, they will form close-ranked forests—too close-ranked, often, to permit the development of stout trunks. So characteristic is this weediness of some of the lesser pines that it has even given one species its characteristic name: lodge-pole pine.

Science News Letter, January 31, 1953